LAHTI PRECISION
Experience that weighs

USER'S MANUAL

WA-810 Totalizing Belt Scale Indicator

DE020504 V1.60

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1. PREAMBLE

1.1. For Quick Orientation

Manual contents

This manual is for WA-800 series indicators, program version V0006 or later.

How do I find the required information quickly?

- Read this chapter.
- Read chapter "How to use this manual".
- Look up the table of contents.

What do I do if a fault occurs?

- First read the chapter Event Messages and try to remedy fault.

1.2. How to use this manual

This manual is designed to show you how to use the system.

Read the following to find the required information quickly and easily:

How do I read the manual?

The WA-800 manual doesn't have to be read from the beginning to end. Use manual as a reference book. Table of contents will help you to quickly find the information.

Many parameters have to be set and calibration functions have to be performed in correct order. In order for the device to work properly, follow that order.

Who does this manual serve?

This manual is written for a basic user.

2. SAFETY INSTRUCTIONS

To avoid personal injury and equipment damage, follow the safety regulations below.

Use as originally intended

The measuring system and mechanical components connected to it are exclusively designed for weighing and related controlling tasks.

Hazards and risks

No danger originates from the measuring system itself, if it is properly installed and commissioned.

However, upon use of the measuring system, danger may result during transit of material to be weighed (e.g. from auxiliaries used to handle or feed material) or if system assumes control tasks.

Residual risks may originate from the measuring system if unskilled operators improperly handle the system.

The measuring system can be part of a more complex plant. The user is fully responsible for the overall plant safety.

Identification of risks

This symbol indicates that the machine or component used has the potential to cause severe injury or death.

This symbol indicates that the machine or component used has the potential to cause damage to the measuring system or other plant sections.

Personnel

Only skilled persons may exclusively perform preparation, installation, commissioning, operation, maintenance, and servicing.

All persons working on the measuring system are required to observe the safety hints and know the parts of the technical documentation relevant to their work.

The supervisor is responsible for instructing his operators to observe all regulations and instructions given.

Parameter Changes

The measuring system's functionality is determined by parameters, which must exclusively be changed by persons familiar with the measuring system operating principles. Parameters incorrectly set may cause injuries or damage to the machine whenever a user control system is connected. They can also adversely affect weighing operation.

Password

Software parameters are protected from unintended change by password. The measuring system user has to ensure safe password handling.

Error Message Acknowledgement

Error messages may be acknowledged only after cause of the fault has been remedied.

Before you acknowledge an error message, check to see that connected peripherals properly operate. Check to see that connected control systems, if any, are in fail-safe state.

Maintenance and Repair

- During maintenance and repair, observe any warning symbols on the scale.
- Before performing work on the mechanical system or peripherals (particularly the control system), disconnect the measuring system and protect the system from inadvertent restart.
- Before performing work on the electrical equipment, disconnect the power supply.
- The devices may be operated only in the provided housings. There is danger of contacting live parts.

Moisture Protection

Protect all system parts, electrical items in particular, from moisture (e.g. during maintenance and servicing) when housings are open. Observe housing protection standards.

Modification and Replacement

Unauthorized modifications to the system and/or use of replacement parts not supplied by manufacturer voids manufacturer's liability for any resulting damages. This particularly applies to modifications, which have the potential to affect the operating safety of the measuring system.

Replacement of Components

Spare parts must meet the technical specifications indicated by manufacturer. To ensure this requirement is met, only genuine spare parts from manufacturer should be used. When using other spare parts, the warranty will be void.

3. PRODUCT OVERVIEW

3.1. Characteristics

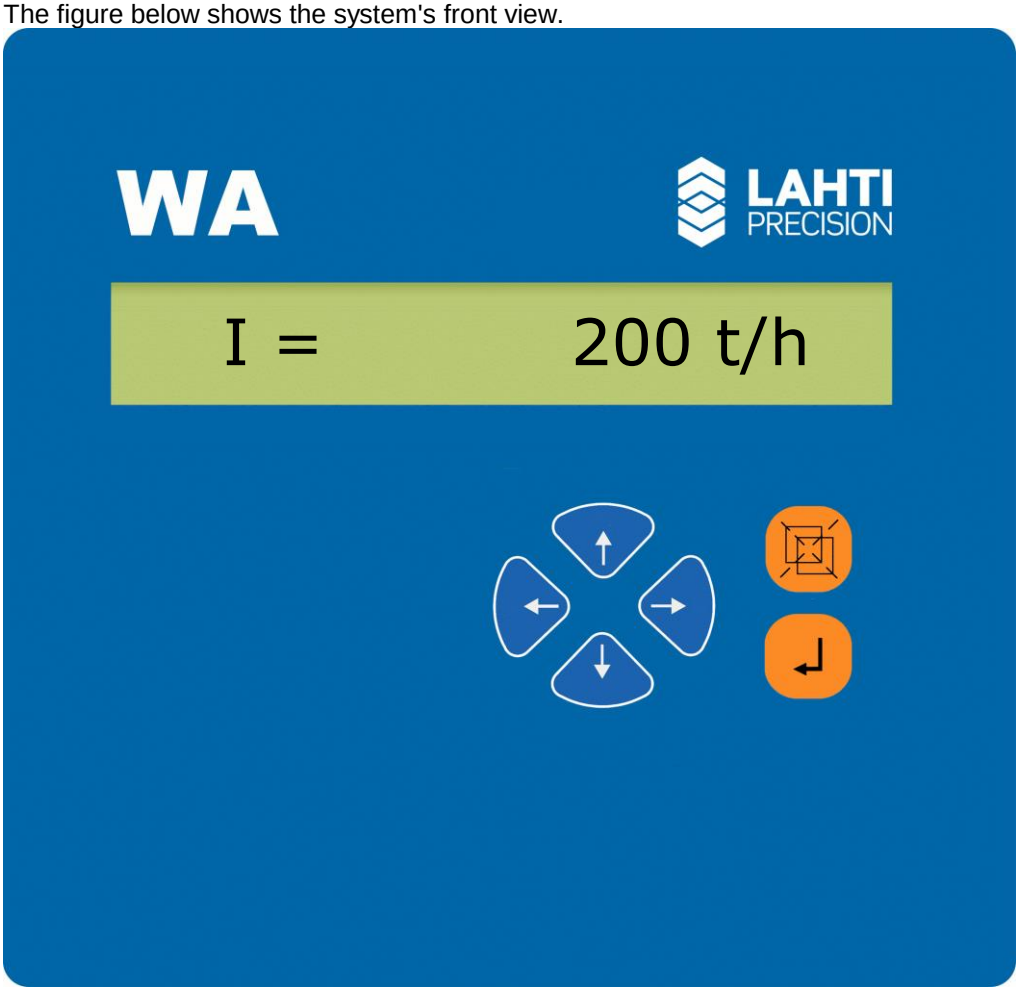
WA-810 device is a totalizing belt scale indicator designed for applications using stand-alone belt weigher with on-site electronics.

WA-810 is not approved for verified commercial usage at this moment.

3.2. Control Elements

3.2.1. General Information

The figure below shows the system's front view.



You can see two areas, the Display and the Keyboard. Their most important elements are listed below and described on the pages to follow.

The display supplies, e.g.

- Weight/massflow values
- Scale status information (display symbols)
- Event messages

- Dialogs

The keyboard covers, e.g.

- Direction keys
- Function key and enter key

3.2.2. Display

The display consists of an LCD display with 20 characters.

On the left
- Rotating point as belt-motion indicator.
- The scales is on, feed rate and flow rate are recorded.
- Only belt load and belt speed are measured in the shut-down state (point unmoving).
- If an event is pending it is indicated by an event message (alphanumeric code).
- The display then alternately shows the belt-motion indicator and event message for approx. 5 seconds each.

On the right
- Selectable display

1. a) Counter, Belt load, belt speed and massflow display (Standard values)

Display		Meaning
Z1 =	5000 kg	Counter
I =	1000 kg/h	Feed rate
Ir =	50.00 %	Feed rate in percents relative to nominal feed rate
Q =	10.000 kg/m	Belt load
Qr =	50.0%	Belt load in percents relative to nominal belt load
V =	0.0500 m/s	Belt speed

Display format and dimensions of Z1 and I can be selected separately.

2. Event messages

In the WA-810 device event messages are shown on the left side of the display. Event message is a code, which is made up of one letter and one number. For more information on event messages see chapter 7.

3. Menu functions

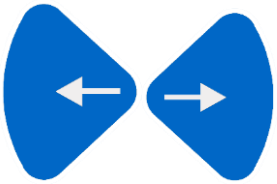
Functions and dialogues can be called up using the menu.

3.2.3. Keyboard

In the WA-810 device keyboard, there are two blocks of keys, i.e. 'direction keys and 'function keys' (from left to right).

- The **direction keys** are used for navigation, display selection and input of figures.
- The **function keys** are used to open menu tree, start functions and confirm/abort entry.

The tables below reflect all possible keys, or key combinations. It may be that a certain key or key combination is defined only in the one or other operating state.

Direction keys functions	
Key	**Function**
	▪ Select display ▪ Select function ▪ Increase or decrease the blinking digit to enter a number
	▪ Move cursor to the left or right to continue entering the number.
	▪ Open function distributor or abort entry
	▪ Start functions ▪ Confirm entry

4. MENU TREE

4.1. General

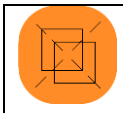
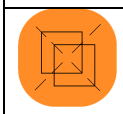
The menu can be divided in two parts; Basic functions and Setting functions.

Basic functions include all necessary functions for daily use. These are explained in the chapter 4.3.

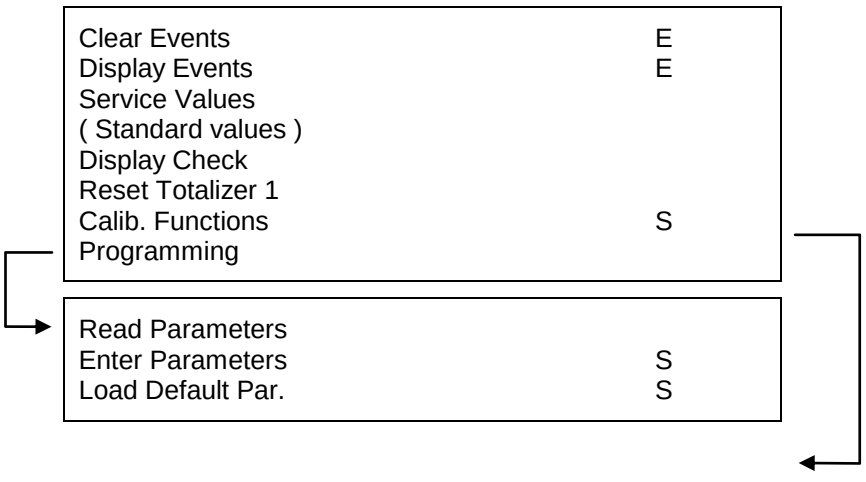
Setting functions include menu items that are protected with a password. These functions are used to calibrate and configure the device for use. These are explained in Detailed Operating Manual in the chapter 4.4.

4.2. How to use the menu

Opening the menu and navigating in it:

	Call up the menu using menu button. The previously selected function will be displayed if no event is pending. Display Events function is shown if any events are active.
	Navigate in the menu using down and up arrow buttons.
	Select a function or open sub-menu.
	Return to the normal display, or abort a function.

4.2.1. Menu structure



TW: Tare	S
CW: Weight Check	S
LB: IMP/Belt	S
Set Time	S

The menu structure is circular, which means that user can move from the last item to the first item by pressing down arrow key.

The 'Program' and 'Adjustment functions' call up sub-menus, which can be scrolled through using the arrow keys.

S= Adjustment functions which can only be accessed with a password. The password is queried once the function has been called up.

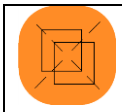
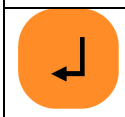
E= This item is visible only if an event is pending.

'Browsing' through the menu does not restrict any scale-specific functions.

4.3. Basic functions in the menu

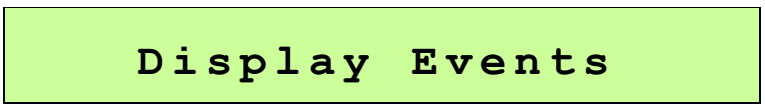
4.3.1. Clear Events

This menu item is for acknowledging all events.

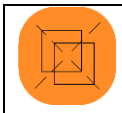
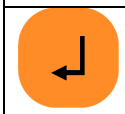
	Call up the menu
	Scroll to "Clear Events" function in the display.
	Select function

All pending events will be acknowledged. If the cause of each event has been corrected the corresponding event message will disappear. Otherwise only the display mode of the message will change (see definition)

4.3.2. Display Events



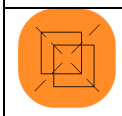
This menu item is for browsing through all events.

	Call up the function distributor
	Scroll through until the function ‘Display Events’ appears in the display.
	Select function

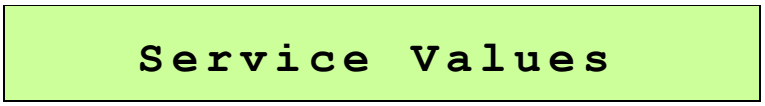
The following information will be displayed

Name e.g. Mains failure
Short symbol e.g. E1
and a short info e.g. Parameter O01 of the event displayed.

The short info shows the corresponding parameter.

	Several events can be viewed with the cursor keys.
	Return to the normal display. The normal display will be returned to if nothing has been entered for 20 seconds.

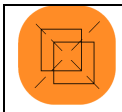
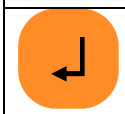
4.3.3. Service Values



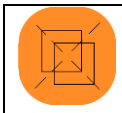
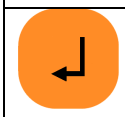
This menu functions changes the process values shown in the display. Service values show more detailed information of the system.

The details of Service values are explained in chapter 3.2.2 Display.

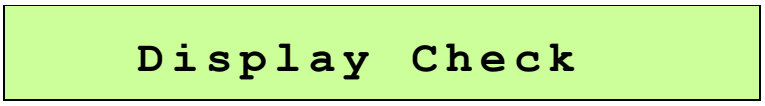
To show Service Values, do the following:

	Call up the menu.
	Scroll through until the function ‘Service Values’ appears in the display.
	Select function.
	Now you can scroll through and see the service values.

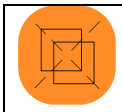
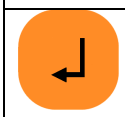
To change the Standard values back, do the following:

	Call up the menu.
	Scroll through until the function ‘Standard Values’ appears in the display.
	Select function.

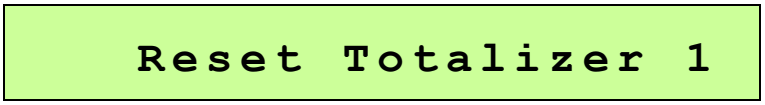
4.3.4. Display Check



This function performs a self-test on the display.

	Call up the menu.
	Scroll through until the function ‘Display Check’ appears in the display.
	Select function. All visible segments of the display blinks 4 times. Display condition can be seen by checking that all segments are active. Name of the device (WA-810) and version number are shown at the end of the test. Test ends automatically.

4.3.5. Reset Totalizer 1



This function resets the sum counter.

	Call up the menu.
	Scroll through until the function ‘Reset Totalizer 1’ appears in the display.
	Select function.

4.4. Setting functions in daily use

Setting functions include:

- **Calibration functions**
- **Parameters**

These functions are protected by a password. The only exception is the read parameters function in parameters menu.

We recommend obscuring the password, when this manual is given to a person who hasn't rights to perform these setting functions.

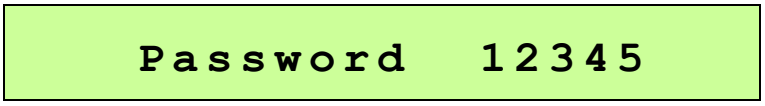
Password	07734

Using the setting functions is recommended only if user has a good knowledge of the system.

Incorrect parameters can cause serious faults. Faults can also be hidden defects which can come up later. If the device is connected to external control system faulty operation can cause personal injuries or device failures.

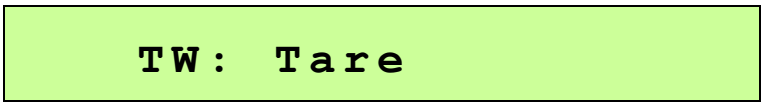
Entering the password

Device asks for the password when protected functions are selected from the menu. Protected functions can be opened again in 2 minutes after exiting without needing to reenter the password.



Password must be entered with arrow keys. Left and right arrows move the selection from a number to another. Up and down arrows change the value of the selected number. A number blinks when it is selected. Enter button must be pressed when all numbers of the password are entered.

4.4.1. Tare TW



The taring program calculates the zero point error of the belt weigher over one belt circuit. .

This value is used to correct the continuous-measuring results in normal operation.

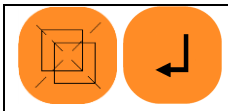
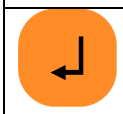
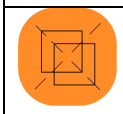
Preconditions:

1. Under no circumstances may there be any material on the belt.

2. The mechanical equipment within the scales area must be cleaned. Deposits, which will build up immediately once normal operation is begun, may be ignored.

3. The belt must be running.
   A corresponding message occurs automatically.

Procedure:

	Menu, adjustment functions, password
	Scroll TW: Tare
	Start
	May be aborted at any time

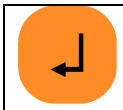
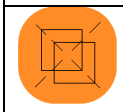
Program running:

Display: - Remaining running time as % of overall running time.
(alternates) - Continuously averaged tare as % of nominal belt load.

Program ended:

Display: - Tare deviation from previous taring as % of the nominal belt load
Deviation = + : Tare increased
Deviation = °- : Tare decreased

(alternates) - Average of overall tare as % of nominal belt load

	The ‘Tare’ result is accepted and stored in the parameter D 03.
	Program can be cancelled by pressing menu button.

Note:

1. The tare may exceed 100% by using the nominal belt load as reference.

2. A mechanical error may be at fault if the deviation ‘Dev.’ is high (>20%). Inspect the weighing platform for e.g. stuck particles of material.

5. EVENT MESSAGES

5.1. General

All important scales functions are monitored internally. An event message is displayed if an error occurs.

Example:

Status Message E1 Mains Failure

Status messages appear in the left part of the display and are indicated by a category ID (e.g. ‘E’) and a number (e.g. ‘1’). An explanatory text may also be called up.

Events are divided into 4 classes. The event may be allotted to a particular class by selecting the corresponding parameter.

- **ALARM** Display blinks quickly. Totalizing switching itself off, scales not ready for service. May only be turned on again after the cause of the problem has been removed and the message has been acknowledged.

  Acknowledgement: The blinking will stop but the message remains if the cause of the problem has not been rectified.

- **WARNING 1** Display blinks slowly.Totalizer continues to function.

  Acknowledgement: The blinking will stop but the message remains if the cause of the problem has not been removed.

- **WARNING 2** Permanent display.

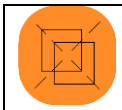
  Acknowledgement: Not necessary. Once the source of the problem has been removed the message disappears automatically.

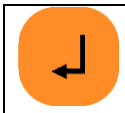
- **IGNORE** No event monitoring other than Min-Max messages from contact outputs.

If several events occur simultaneously, the event with the highest priority will be displayed.
Priority: Alarm, Warning 1, Warning 2

5.2. Operation

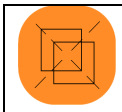
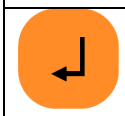
5.2.1. Acknowledging Events

	Call up the function distributor
	Scroll to “Acknowl. Event” function in the display.

	Select function

All pending events will be acknowledged. If the cause of each event has been corrected the corresponding event message will disappear. Otherwise only the display mode of the message will change (see definition)

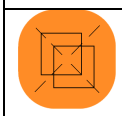
5.2.2. Displaying Event Messages

	Call up the function distributor
	Scroll through until the function ‘Display Events’ appears in the display
	Select function

The following information will be displayed

Name e.g. Mains failure
Short symbol e.g. E1
and a short info e.g. Parameter O01 of the event displayed.

The short info shows the corresponding parameter.

	Several events can be viewed with the cursor keys.
	Rerturn to the normal display. The normal display will be returned to if nothing has been entered for 20 seconds.

5.2.3. Contact outputs

Aggregated alarm will remain on until a successful acknowledgement is made.

Min-Max outputs are independent of the event class and also function with IGNORE. Limit values are recorded for the duration of an event but only when the scales are on.

5.3. System message (S)

5.3.1. S1: Memory Error

Program and parameter memory are checked every cycle, and an error has occurred. In the majority of cases this means that the scales is no longer ready for service.

Measures : Contact Lahti Precision
Parameters : O 02

5.3.2. S5: Dongle fault

The dongle (memory for the parameters in the load cell plug) is defective or completely missing.

Measures : Check the load cell connection
Parameters : O 15
Note : WA-810 is fully functional even without a dongle since the parameters are also internally stored. The changed parameters should be keyed in again if hardware is replaced.

5.3.3. S9: Communication Host

Serial communication has been interrupted for longer than the timeout-period.

Measures : Check cable connections
Parameter : L 03

5.4. Electrical system (E)

5.4.1. E1: Power failure

The mains voltage failed or was turned off. The flow of material may not have been registered during this time.

Measures: Acknowledge message
Parameter: O 01

5.4.2. E2: Tachometer Namur Error

Short circuit or break in the speed sensor cable. The scale is no longer ready for service.

Measures: Check the cabling to the speed sensor. Speed measuring can be temporarily turned off with parameter B03.
Parameter: O 04

5.4.3. E6: Error External Event

There is an external noise signal.

Measures: Rectify fault.
Parameter: P06 and O11

5.5. Calibration (C)

5.5.1. C1: LC input

The load cell cable is interrupted, not connected or is improperly connected.

Measures: Check the cabling. If it is as it should be the load cell or the load cell amplifier may not be working.
Parameter: O 06

5.5.2. C2: Tachometer input

The output frequency of the speed sensor exceeds 3,000Hz. This situation can only occur with a subsequent change in belt speed (e.g. gears).

Measures: Check the dimensioning of the speed sensor. If necessary, measure the pulse frequency with an oscilloscope.
Parameter: O 03

5.6. Maximum (H)

5.6.1. H2: Belt Load > MAX

The current belt load exceeded the set limit value.

Measures: Usually none, if the message H4 does not also occur or if system-specific limits are to be observed.
Parameters: F 07, F 08

5.6.2. H4: LC Input > MAX

The weigh system is overloaded. Measuring errors may occur.

Measures: Check the bin feeder, as the belt load is too large.
Parameters: O08

5.7. Minimum (L)

5.7.1. L2: Load < MIN

The current belt speed is lower than the set limit value.

Measures: Usually none, if the message L4 does not also occur or if system-specific limits are to be observed.
Parameters: F 05, F 06

5.7.2. L4: LC Input < MIN

The weigh system load is too low and measuring is at risk.

Measures: Check the weighbridge mechanics and alignment of the measuring idlers. check the load cell cabling.
Parameter: O 09

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